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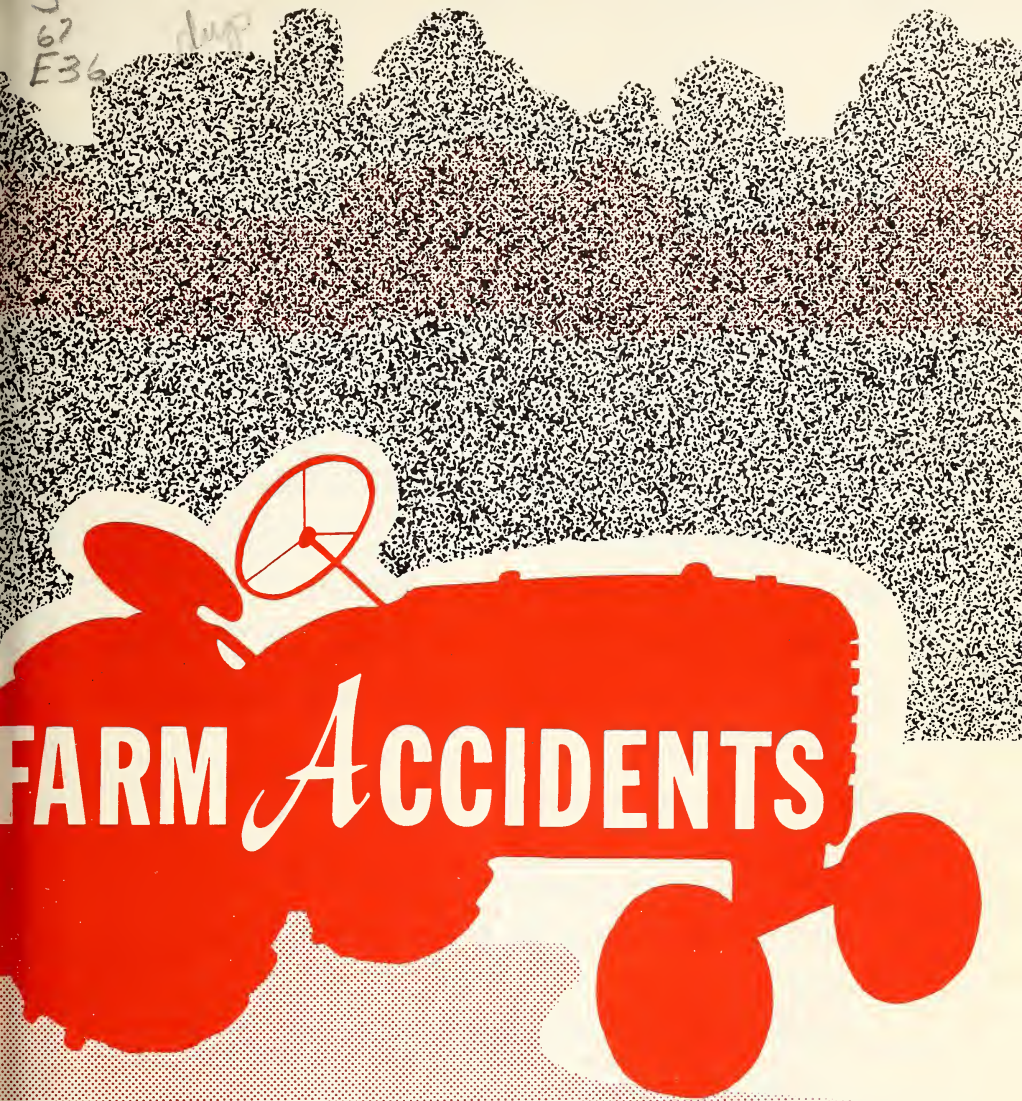
Farm accidents: number, types, social costs & causes

Alvin Lee Bertrand



FARM ACCIDENTS

Number, Types, Social Costs & Causes

By Alvin L. Bertrand

Louisiana State University and
Agricultural and Mechanical College
Agricultural Experiment Station
Charles W. Upp, Director

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Summary

The data used in this study were obtained from three sources: The National Health Survey, a field survey conducted in sample areas of the state, and statistics compiled by the State Department of Health. Analysis of these data determined that:

(1) Approximately 255 persons are injured annually per 1,000 population in the United States. This rate amounts to some 45 million persons per year.

(2) Rural-nonfarm residents have the highest accident injury rate (267 per 1,000 population) when compared to urban residents (253 per 1,000 population) and rural-farm residents (241 per 1,000 population). About 80 per cent of the injuries among rural-nonfarm and urban residents are sustained by males.

(3) Approximately nine million persons currently employed sustain work injuries annually in the United States. Thus eight out of ten injuries in the nation occur in non-work situations.

(4) Rural-farm persons have by far the highest annual rate of accidental injury while on the job, 17 annually per 100 currently employed persons. In both urban and rural-nonfarm residence groups, approximately 13 persons per 100 are injured annually while at work.

(5) Of the 255 persons per 1,000 population injured annually in the United States, 27 are injured in motor vehicle accidents, 46 in work accidents, 107 in home accidents, and 75 in miscellaneous accidents. The high rate of home accidents is attributed to the fact that children, youths, and persons over 65 years of age are usually injured at home.

(6) Comparisons by residence indicate that: (a) Rural-nonfarm persons have the highest rate of injury in moving vehicle accidents; (b) rural-farm residents have the highest rate of accidents in non-moving vehicles; (c) home accident rates are highest among the rural-nonfarm resident group.

(7) People who live on farms have the highest accident rates for five classes of accidents: (a) machinery in operation; (b) struck by an object; (c) caught by or crushed between two objects; (d) one-time lifting or exertion; (e) all other types of accidents. The nature of these accidental injuries suggests programs of safety can be designed for specific classes of accidents.

(8) The population of the United States annually experiences about 460 million restricted activity days due to injury, a rate of 261 days per 100 population. An annual average of 64 days per 100 population is spent in bed because of accidental injury and 126 days of work are lost annually per 100 persons 17 years of age and over.

(9) Rural-farm residents experience a considerably higher rate of restricted activity days, bed disability days, and work-loss days than do

urban and rural-nonfarm residents. These findings definitely establish the fact that accidental injuries while at work represent a higher per capita social and economic cost to farmers.

(10) Some 1,997 accidental deaths occurred in Louisiana in 1962. Of this number, 45 per cent occurred in places classified as rural. The data are not sufficiently detailed to determine what percentage of the injuries to rural residents occurred on farms.

(11) In Louisiana, major accidents apparently are more likely to occur on the larger farms. Education and safety consciousness are negatively correlated with major accidents.

(12) A majority of Louisiana farmers do not follow certain safety precautions such as prohibiting smoking in their barns, discussing a fire plan with family members, having on hand antidotes for toxic chemicals, and owning fire extinguishers.

(13) Farmers view accidents resignedly, attributing them to carelessness, illiterate and unskilled labor, and fate.

The above findings suggest that certain situational factors structure farming as an occupation in such a way as to encourage a high rate of accidents. These factors may be identified as: (1) social control factors, in the sense that farm social systems include relatively few social control mechanisms designed to enforce safety practices; (2) labor force factors related to the relatively high proportion of "substandard" or "marginal" labor employed on farms; (3) socio-psychological factors manifested in the attitude of farmers toward risk-taking.

In summary, the implication of the above analysis is that the high accident rate on farms can be largely accounted for in terms of the social and cultural environments within which farm work is done.

FARM ACCIDENTS

Number, Types, Social Costs and Causes

ALVIN L. BERTRAND
Professor, Departments of Sociology and Rural Sociology

Introduction

The accident problem has been subjected to increasing investigation the last 30 to 40 years. During this time, much has been learned about the nature and cause of accidents and some progress has been made in reducing both fatal and nonfatal accidents in the nation. However, despite the progress made, the social and economic costs of accidents remain at a high level, and constitute a social problem worthy of continued study and research.

One facet of the accident problem is of particular interest to persons in agriculture and related occupations. This is the fact that fatal and nonfatal accidents traditionally have been more frequent among persons living on farms than among persons engaged in most other occupations. Why residence has been so closely associated with accidents is not altogether clear, although some clues are available from past studies.[1] Nor is it known whether or not patterns of accidents are continuing today as they have in the past. These two important questions were the focus of the research undertaken and reported here.

The report which follows directs attention to: (1) the magnitude of the accident and injury problem and differences of this nature among the various residence groups, (2) the safety practices and other correlates of accidents for a sample of Louisiana farmers, and (3) the analysis of the findings in terms of a theoretical frame of reference.

Objectives

The first specific objective of the research undertaken was the determination of the magnitude of the accident rate and of differentials in the number and type of accidents in farm and nonfarm areas. In this regard, national data on nonfatal but disabling accidents have not been available until recently. The U. S. Department of Health, Education and Welfare inaugurated a National Health Survey in the latter 1950's. This survey has provided authentic information for the first time on nonfatal injuries and other disabilities of individuals living in urban,

[1]Two comprehensive studies are: Prodipto Roy, "Selected Environmental and Human Factors Associated With the Incidence of Accidents to Farm People in Pennslyvania," unpublished Ph.D. dissertation, Department of Agricultural Economics and Rural Sociology, Pennsylvania State University, 1957; and Saad M. Gadalla, *Selected Environmental Factors Associated With Farm and Home Accidents in Missouri*, Columbia, Missouri, Agricultural Experiment Station Research Bulletin 790, 1962.

rural-nonfarm and rural-farm places. States and local reporting units do not generally report accident data in this manner, although special tabulations of this type are occasionally done.

The second objective of the study was to compare rural and urban accident experiences in order to determine the nature of possible pattern differentials. It was hypothesized that both the causes and the nature of accidents would vary considerably from city to country, with rural people being more frequently involved in accidents related to mechanical contrivances and more frequently being seriously hurt.

The third objective and final one was to uncover, if possible, the factors contributing to the high level of farm accidents. Many factors need investigation in this regard. It is not clear from previous study whether or not technology is the most important variable in farm accidents. Innovations never stop and after each new purchase, the farmer has to learn new operational procedures, which in turn require some change in his behavior pattern. The extent to which the structure and functioning of farming systems tend to encourage accidents is also not clear. These and other factors served as the focus of investigation in connection with the above objectives.

Source of Data

Fortunately for the investigator, the statistics relating to accidents from the National Health Survey were published in late 1962 and early 1963. Thus, information on types of injuries, days lost from injuries, and other aspects of the accident picture were available for this report. The procedure was to assemble the data from the National Health Survey into tables appropriate to the objectives of this study. In addition, charts were prepared to highlight certain comparisons and patterns. Insofar as is known, this is the first attempt to systematically analyze these particular aspects of the Survey's findings.

For those persons who are not familiar with the National Health Survey, it may be noted that it is a continual operation. Each week a sample of the civilian, noninstitutional population throughout the United States is studied. The reports used in this analysis included 104 weeks of interviews extending over two years (July 1959 - June 1961). Interviews were conducted in approximately 76,000 households that included some 250,000 persons. The questionnaire used and the over-all design and plan of the study appear in the reports of the National Health Survey.[2]

The annual estimates that are included in the tables are estimates based on the number of persons injured or otherwise affected who were living in the household at the time of the interviews. In each instance, the sample population was expanded proportionately to the estimated total population. Since all the estimates are based on a family population

[2]See: Health Statistics, U. S. National Health Survey, U. S. Department of Health, Education and Welfare, Series A (-4) and Series B (37-42), 1958-1963.

rather than an entire population, they are subject to a sampling error. The sampling errors, for the most part, are of relatively low magnitude. Where the sampling errors are high, i.e., they do not fall in acceptable ranges, notation is made.

Louisiana data for this study were obtained from a field survey which was planned to obtain information relative to farmers' safety practices and other characteristics which might be associated with accidents. The survey was worked out in consultation with Agricultural Extension Service specialists, public health specialists, agricultural engineers, and others. A comprehensive questionnaire was developed and used in the interview of household heads in carefully selected sample areas. The sample areas were drawn to include the major socio-cultural areas of the state (French-Catholic South Louisiana and Anglo-Saxon Protestant North Louisiana) and three major type-farming areas (sugar cane, rice, and cotton). Specifically, Assumption Parish was selected to represent the sugar producing areas of the state, Acadia Parish was selected to represent the rice producing areas of the state, and parts of Madison and Richland parishes were selected to represent the cotton producing areas of the state. Each sample area was divided into sampling units and segments, and an area probability sampling technique was used to select the particular farms where the interviews were to be completed. Altogether, data were obtained from 297 farms.

Definition of Terms

Several terms from the National Health Survey are used throughout this report and need clarifying. *Residence* as used by the National Survey and in this study signifies the usual division of the population into three residence classes: urban, rural-nonfarm, and rural-farm. The definition of rural and urban residence is the same as that used in the 1950 Census, as follows:

(1) *Urban.*—The urban population includes all persons living in (a) places of 2,500 inhabitants or more which are incorporated as cities, burroughs, or villages; (b) incorporated towns of 2,500 inhabitants or more except in New England, New York, and Wisconsin, where "Towns" are simply minor civil divisions; (c) the densely settled urban fringe including both incorporated and unincorporated areas around cities of 50,000 or more inhabitants; and (d) unincorporated places of 2,500 inhabitants or more outside any urban fringe. The remaining population is classified as rural.

(2) *Rural-Farm.*—The rural-farm population includes all rural residents living on farms. For National Health Survey purposes, the statement of the household respondent to the effect that the members of the household lived on a farm or ranch was accepted with the following exception: (1) A house occupied by persons who pay cash rent for the house and yard only was not counted as a farm or ranch even if the surrounding area was farm land. This special case did not cover: (a)

the living quarters of a tenant farmer who rented farm land as well as a house and yard; (b) the quarters of a hired hand who received living quarters on the farm as part of his compensation; or (c) separate living quarters inside a structure which was classified as being on a farm. In all cases the living quarters were counted as being on a farm.

(3) *Rural-Nonfarm.*—Included all the remaining rural population.

In the text which follows, when a reference is made to *accidents on farms,* all accidents occurring in farm buildings or on cultivated land are included. Accidents occurring in the farm home or premises are shown as *Home Accidents.*

In each instance, where age groupings appear, *age at last birthday* was recorded by single years and combined into groups.

Other terms, when used in a specific rather than a general context, are defined as they appear in the text.

The Incidence and Pattern of Accidental Injuries[3]

Data from the National Health Survey, as indicated, portrays the national picture insofar as accidental injuries are concerned. Although the focus in this study is rural-urban comparisons, a review of the findings for the population as a whole serves as a point of departure. Data are presented according to age, sex, and residence characteristics.

The Number of Persons Injured Annually

The U. S. Picture. It can be seen from Table 1 that 255.2 persons are injured annually per 1,000 population in the United States.[4] At this rate it is estimated that an average of 45 million persons per year sustain injuries sufficient to require attention or to restrict their usual activities. The magnitude of this rate, more than one out of every four persons, is sufficient to attract national concern, especially in the light of the many programs relating to accident prevention.

The National Health Survey data indicates males are more susceptible to accidents than females. Among the former, the injury rate was 301 per 1,000 while among the latter it was only 212 per 1,000 persons. Interestingly, the injuries received by male school age children and young adults were chiefly responsible for this phenomenon. (See Figure 1.) Apparently, two factors account for this fact. First, this age group has not achieved the safety habits of older persons. Second, their behavior patterns place them in situations which make them more

[3]An *injury,* as used here, includes a condition such as fractures, lacerations, convulsions, burns, etc. which are commonly thought of as injuries. In addition, effects of exposure, such as sunburn; adverse reactions to immunizations or other medical procedures, and poisonings are so defined. The conditions included appear in the International Classification of Diseases as injury code numbers N800-N999.

[4]Annual estimates of the number of persons injured are derived from the count of persons who reported an injury during the two-week period prior to the week of interview.

TABLE 1.—Number of Persons Injured per 1,000 Population per Year, by Residence and Age: United States, July 1959 - June 1961

Residence and Age	Number of Persons Injured per 1,000 Population per Year			
	All Classes	Urban	Rural-Nonfarm	Rural-Farm
All Areas				
All Ages	255.2	252.5	267.3	240.6
0- 5	293.7	307.9	294.1	221.6
6-16	314.9	328.7	332.6	224.7
17-24	277.9	278.3	284.3	262.5
25-44	227.8	216.7	233.8	275.9
45-64	218.3	213.1	220.3	241.4
65+	189.5	180.7	208.2	202.5

Source: *Health Statistics From the U. S. National Health Survey,* Series B, No. 37, Table 18, U. S. Department of Health, Education and Welfare, Washington 25, D. C., October 1962.

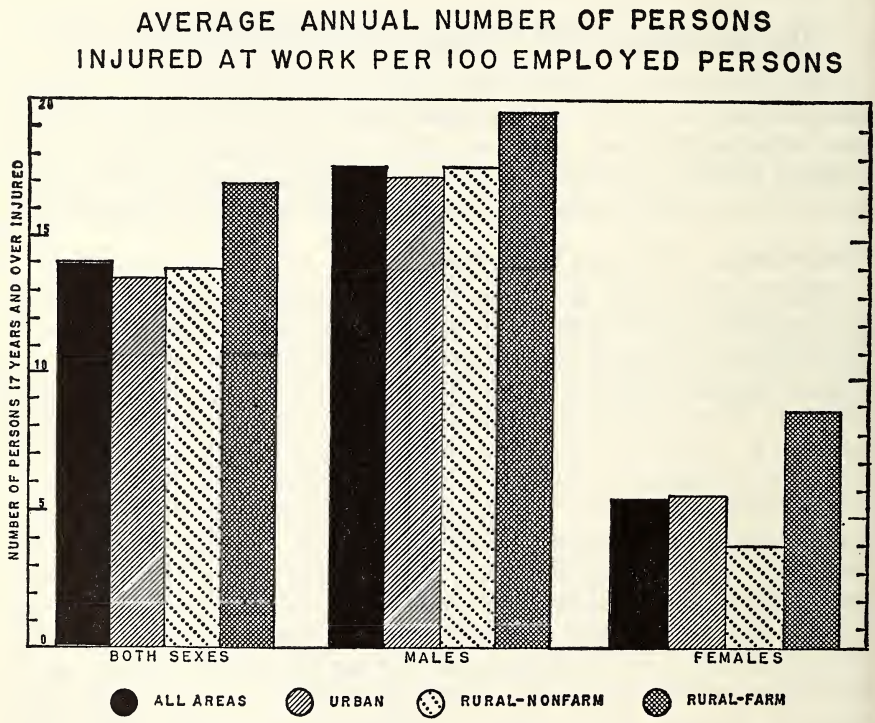

FIGURE 1

susceptible to accidents. The fact that over four males out of ten in the ages 17-24 years are accidentally hurt each year is indeed a matter worthy of further investigation.

Residence Differences.—When *all* major injuries are considered among the three residence groups, rural-nonfarm residents have the high-

est annual accidental injury rate, 267.3 per 1,000 population (Table 1). *The lowest rate is found among persons who live on farms, 240.6 per 1,000 population.* This is a most important finding in terms of the purpose of the present study. Urban rates hold an intermediate position but are close to rural-nonfarm rates. Some 252.5 persons per 1,000 population living in cities are injured annually.

The higher rates of injury among rural-nonfarm and urban residents are principally due to the large number of injuries sustained by males in these areas. However, in all instances, accidental injuries increase to the early adult ages and then gradually decrease.

Why farm people as a whole should experience fewer injuries than non-farm people is difficult to explain. No doubt crowded conditions and other environmental factors are involved. There is need for more detailed study before a final conclusion can be reached. Previous reports have generally stressed that farm accident rates were unusually high, but usually failed to show that people living on farms sustain fewer injuries, relatively, than persons not living on farms.

The Number of Persons Injured Annually While At Work

The place where a person is injured is an important clue to accident cause and prevention. It is also an important commentary on the behavior pattern of occupational groups which represent distinct subcultures within the greater society.

The U. S. Picture.—The data collected in the 1961-62 National Health Survey indicate that an average of about 9 million persons sustained injuries annually while at work. The 9 million persons comprised about 20 per cent of the total number of persons injured annually in all accidents, that is, both work and non-work accidents. This is a significant figure in that it highlights the fact that eight out of ten injuries occur in non-work situations.

Age differentials again indicate that younger persons, in this instance, 17-24 years of age, have higher rates (number per 100) of accidents. In fact, for the U. S. as a whole, accident rates while at work decline steadily with advancing age of employees. (See Table 2 and Figure 2.) A comparison of accidents while at work shows men to have a much higher rate than women. However, contrary to male patterns, older females have a slightly higher accident rate than younger females.

Residence Differences.—Of the 9 million persons injured annually while at work during the year of the study, approximately 1,219,000 were farm residents, 2,441,000 lived in rural areas but were not occupied in agriculture, and the remaining 5,437,000 lived in urban places. In terms of the totals, it can be seen that the majority of all work accidents occur in urban places. However, when accident rates are computed, such as the number per 100 currently employed persons, a different picture arises. In both the urban and rural-nonfarm groups, about 13

TABLE 2.—Average Annual Number of Persons Injured[1] While at Work per 100 Currently Employed Persons per Year, by Residence, Sex, and Age: United States, July 1959 - June 1961

Sex and Age	Residence			
	All Areas	Urban	Rural-Nonfarm	Rural-Farm
Both Sexes				
All Ages—17+	13.3	12.8	13.2	16.7
17-24	15.6	14.0	19.1	17.8
25-44	13.5	12.6	13.7	18.8
45-64	12.7	13.2	9.8	15.4
65+	9.2	7.6	(*)	(*)
Male				
All Ages—17+	17.4	17.0	17.4	19.3
17-24	23.1	19.9	30.2	24.9
25-44	17.6	16.7	17.7	22.3
45-64	16.0	17.0	13.3	16.5
65+	10.3	11.8	(*)	(*)
Female				
All Ages—17+	5.3	5.5	3.7	8.5
17-24	4.9	6.5	(*)	(*)
25-44	4.5	4.5	(*)	(*)
45-64	6.2	6.8	(*)	(*)
65+	(*)	(*)	(*)	(*)

[1]Includes only currently employed persons with work injuries involving one or more days of restricted activity, or medical attention.

*Magnitude of sampling error precludes showing separate estimates.

Source: *Health Statistics From the U. S. National Health Survey*, Series B, No. 41, Table 4, February 1963.

persons per 100 are injured annually while on the job. Amongst rural-farm persons, this figure jumps to approximately 17. The same pattern persists for both males and females, although males usually have considerably more injuries.

The above finding that farm groups experience relatively more accidents while engaged in work is a key one. The reason for this pattern is undoubtedly to be found in the complex of the work situation. It suggests that accident prevention programs for farmers should concentrate on work situations and hazards. The latter point will be expanded in the last section of this report.

When an analysis of the data on injuries while at work is done according to age groups, an interesting discovery is made. A larger relative number of persons from 25 to 64 years of age are injured on farms, but relatively more persons 17 to 24 years of age are injured off the farm. Why this is true is not too clear. Possibly jobs which are available to younger persons are more likely to be hazardous, or to be done without benefit of an apprenticeship. It could also be that younger city persons work at jobs which are not so closely supervised and controlled.

The Cause and Circumstances of Accidents

It was hypothesized for purposes of this study that the cause and circumstances of accidents would differ significantly for farm and nonfarm places. Fortunately, data collected in the National Health Survey permitted testing this hypothesis in a general way. Tables 3 and 4 were

TABLE 3.—Number of Persons Injured[1] per 1,000 Population per Year, by Residence, Age, and Class of Accident: United States, July 1959 - June 1961

Residence and Age	Class of Accident				
	Moving Motor Vehicle	Non-Moving Motor Vehicle	While at Work	Home	Other and Unknown
All Areas					
All Ages	16.4	10.7	46.4	106.5	75.3
0- 5	(*)	8.9		209.5	71.6
6-16	14.8	11.6		128.6	159.8
17-24	32.5	13.8	79.9	57.0	94.8
25-44	17.2	11.8	81.1	73.7	44.0
45-64	18.8	7.3	77.8	78.0	36.3
65+	13.7	11.9	18.3	110.9	14.7
Urban					
All Ages	13.0	10.2	47.2	103.6	78.5
0- 5	(*)	9.3		218.1	76.7
6-16	10.8	10.9		138.0	169.1
17-24	13.8	12.4	74.7	62.2	113.2
25-44	16.4	10.0	76.6	66.9	46.8
45-64	14.4	7.5	82.7	72.2	36.2
65+	16.5	14.5	15.9	96.9	36.8
Rural-Nonfarm					
All Ages	26.2	9.6	40.4	119.1	72.0
0- 5	(*)	(*)		225.2	57.8
6-16	26.2	9.3		139.5	157.6
17-24	79.7	(*)	83.2	47.0	54.7
25-44	21.9	10.0	81.0	80.1	40.8
45-64	(*)	54.8	85.0	40.6	85.0
65+	(*)	(*)	(*)	137.5	31.7
Rural-Farm					
All Ages	10.7	15.4	55.6	91.4	67.4
0- 5	(*)	(*)		123.1	85.0
6-16	(*)	19.4		70.1	129.5
17-24	(*)	(*)	100.3	49.5	68.0
25-44	(*)	28.6	108.5	94.8	36.3
45-64	(*)	(*)	94.5	94.7	28.9
65+	(*)	(*)	(*)	137.3	(*)

[1]Includes only persons with injuries involving one or more days of restricted activity.

*Magnitude of sampling error precludes showing separate estimates.

Source: *Health Statistics From the U. S. National Health Survey*, Series B, No. 37, Table 3, U. S. Department of Health, Education and Welfare.

TABLE 4.—Number of Persons Injured[1] per 1,000 Population per Year, by Detailed Type of Accident and Residence: United States, July 1959 - June 1961

Detailed Type of Accident	Residence			
	All Areas	Urban	Rural-Nonfarm	Rural-Farm
Total persons injured	225.2	252.5	267.3	240.6
Moving motor vehicle	16.4	13.0	26.2	10.7
Uncontrolled fire, explosion, or discharge of a firearm	2.2	2.5	2.4	(*)
Nonmotor vehicle, in motion	5.0	4.6	7.2	(*)
Machinery, in operation	7.4	7.2	7.5	8.5
Cutting or piercing instrument	15.2	12.5	20.9	15.9
Foreign body in eye, windpipe, or other orifice	6.7	5.0	10.3	6.9
Injury caused by animal or insect	10.4	8.1	15.2	11.0
Falls, on stairs, steps, or from a height	24.4	26.3	21.8	21.0
All other falls	44.0	48.4	39.7	32.5
Bumped into object or person	19.8	22.7	17.6	10.1
Struck by moving object	23.3	24.1	17.6	32.5
Handled or stepped on rough object	14.3	12.4	19.3	12.2
Caught in, pinched, or crushed between two objects	10.7	9.0	11.9	16.4
Came in contact with hot object or open flame	7.5	8.4	6.6	5.2
One-time lifting or exertion	12.5	12.1	12.2	15.6
Twisted or stumbled	10.2	11.4	8.9	7.0
Therapeutic misadventure	7.8	7.6	8.8	6.2
All other types of accidents	17.4	17.3	13.4	27.4

[1]Includes only persons with injuries involving one or more days of restricted activity or medical attention.

*Magnitude of sampling error precludes showing separate estimates.

Source: *Health Statistics From the U. S. National Health Survey,* Series B, No. 37, Table 3, U. S. Department of Health, Education and Welfare, October 1962.

prepared to show certain details of accidents for the various residence groups. In keeping with previous discussions, the U. S. picture is described first and followed by residence comparisons.

The U. S. Picture.—On the basis of findings from the National Health Survey, it is estimated, as pointed out previously, that a total 255 persons are injured per 1,000 population annually. Of this number, some 27 persons are injured in motor vehicle accidents (moving and non-moving), 46 persons in accidents while at work, 107 persons in home accidents, and 75 persons in miscellaneous accidents. The latter consists mainly of accidents occurring in public places such as schools, stores, offices, and recreation places, plus injuries resulting from reactions to medical procedures or treatments of one type or another.

When motor vehicle accidents were considered separately, it was found that almost 5 million (4,771,000) persons sustained such accidents

annually.[5] Of this number 2,890,000 suffered injury from accidents involving moving vehicles and 1,881,000 from accidents in non-moving vehicles. Of the latter, the data collected indicated over one-third (35.4 per cent) were injured in accidents classified as "caught in, pinched or crushed," while 15.3 per cent were injured in falls. Interestingly, over two-fifths (41.6) of the non-moving motor vehicle accidents occurred at home.[6] Only 27.5 per cent of the non-moving vehicle accidents occurred on a street or highway.

Table 4 was prepared to show the number of persons injured, by detailed type of accident. Among persons reported injured, the largest number, an estimated 12 million nationally (27 per cent), were involved in accidents described as falls. According to these estimates, some 68.4 persons per 1,000 population suffer injuries of this type annually. Other types of injury found to occur frequently included: (1) being struck by a moving object other than a moving vehicle, (2) bumping into an object or person (including striking or kicking), and (3) being injured by a cutting or piercing instrument.

When accidents are tabulated according to age, it can be seen that children, youths, and persons over 65 years of age are usually injured at home. Persons ranging in age from 17 to 44 years are injured in greater relative numbers while at work. Not unexpectedly, in light of differential automobile insurance rates, persons aged 17 to 24 years had by far the highest rate of moving motor vehicle accidents.

Residence Differences.—It has already been demonstrated that rural-farm persons have higher rates of work injuries than nonfarm persons. Thus, it can be expected that the cause and circumstances of farm located injuries would usually be something related to a work situation.

Study of the data obtained in the National Health Survey on general class of injury shows that the rate of injuries in moving vehicle accidents was approximately twice as high for rural-nonfarm residents as for urban and rural-farm residents. The high degree of mobility among the rural-nonfarm males accounts largely for this differential. One can surmise that this pattern is a function of commuting some distance to work, shopping, recreation, and other places.

When findings relative to non-moving motor vehicle accidents are scrutinized, a different pattern emerges. The highest rate (1.5 persons per 100) occurs among rural-farm residents. One may conjecture that this

[5]For purpose of the National Health Survey a "motor vehicle" was defined as "any mechanically or electrically powered device, not operated on rails, upon which or by which any person or property may be transported or drawn upon a local highway. Any object, such as a trailer, coaster, sled, or wagon, being towed by a motor vehicle is considered part of a motor vehicle. Devices used solely for moving persons or materials within the confines of a building and its premises are not counted as motor vehicles."

[6]Home was considered the place of accidents if the injury occurred outside the home but within the property boundaries of the home.

phenomenon results from the common practice among farmers of operating, repairing, and maintaining many varied pieces of machinery and equipment.

Home accident rates were determined to be higher among the rural-nonfarm residence groups, with persons dwelling on farms experiencing the lowest rate for such accidents. There is no great difference among the three residence groups in rates of accidents classed as "other or unknown," although slightly more accidents of these types appeared in an urban setting.

A study of detailed types of accidents brings out the fact that farm people had the highest rate of accidents for five classes of accidents: (1) machinery in operation, (2) struck by an object, (3) caught by or crushed between two objects, (4) one-time lifting or exertions, (5) all other types of accidents. Each of these five classes represents a type of accident which would ordinarily be associated with a common farm situation. By contrast, urban persons were involved more frequently than other residence groups in accidents relating to falls, accidents having to do with coming in contact with hot objects or open flames, twisting or stumbling accidents, and accidents due to uncontrolled fire, explosions, or discharge of a firearm. The rural-nonfarm population, as noted, led in accidents associated with motor vehicles in motion, and also led in injuries sustained from coming in contact with cutting or piercing instruments and from handling or stepping on rough objects.

The above findings indicate there are enough differences between residence groups in cause and circumstances of accidents to warrant special study. When these factors are isolated, the problem of safety and control can be lessened. Safety programs, for example, could be designed to apply to specific known situations, rather than spread thinly in an attempt to serve for a general class of accidents about which detailed information is lacking.

Selected Aspects of the Social Cost of Accidental Injuries

The costs of accidents may be measured in a number of ways. Probably the most common practice is to convert work days lost and health care expenditures into dollar costs. Such a procedure is subject to a strict economic interpretation and does not account for other types of social costs, such as human suffering and the disruption of normal activities. The latter are intangibles, of course, and not subject to quantitative expression. In the analysis which follows no attempt is made to convert the data into dollar cost figures, which would be arbitrary at best. The interested reader can do this quite simply by multiplying days lost by average wage rates, and he may multiply hospital and disability days by some standardized rate. Related social costs are matters of insight and imagination.

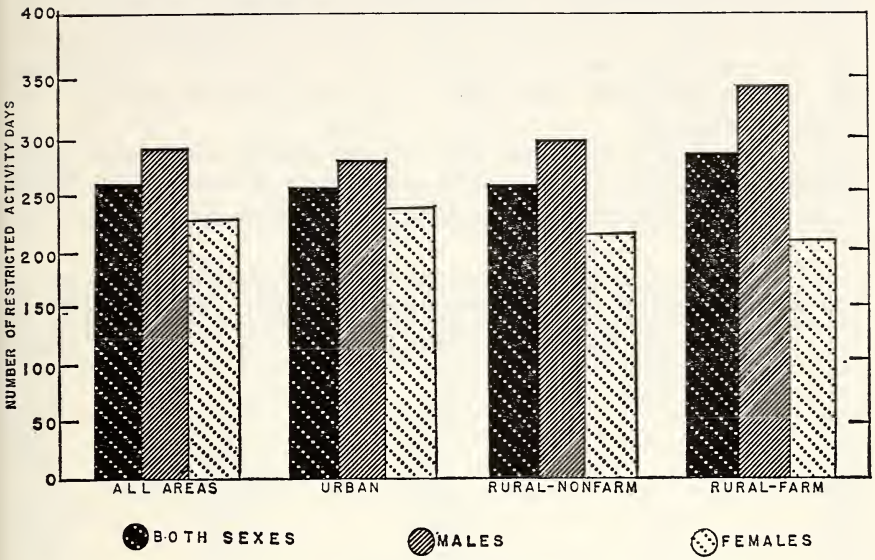

FIGURE 2

The U. S. Picture.—The specific social cost of accidents which were studied are: work-loss days, restricted activity days, and bed disability days.[7] Data for work-loss days are shown only for those ages which normally encompass the active work force. The restricted activity and disability days are shown for all ages.

The estimates derived from the data collected by the National Health Survey through household interviews indicate that the civilian non-institutional population of the United States annually experiences about 460 million restricted activity days due to injury. Some 113.5 million of these days are also bed disability days. Persons employed (17 years and over) had an estimated 8.3 million work-loss days, and children (6 to 16 years) lost 11.9 million school days. Almost one-fourth (23 per cent) of the 45 million persons estimated to be injured annually were determined to have one or more days of bed disability associated with their injury. Some 83.7 per cent of the injured received medical attention.

[7]The following definitions were used in the National Health Survey: *Work-Loss Day*—a day a person normally would have gone to work but could not because of illness or injury. Regular work days less than a whole day were counted as whole days. *Disability Day*—the following terms were used in determining a disability day: hospital days, restricted activity days, bed disability days, and days lost from work. *Restricted Activity Days* are those in which a person reduces substantially his normal amount of activity because of a specific injury or illness.

The number of restricted activity days per 100 population is shown by residence, sex, and age groups in Table 5. As may be seen, activity-restricting injuries are extremely low among the younger age groups, i.e., from 0 to 5 years of age. Such injuries gradually increase with age, reaching a peak of 608.1 days per 100 persons in the 65-and-over age group. Males have higher rates of restricted activity than females at all ages.

It is revealing to learn that for each 100 persons in the nation, an average of 64 days a year is spent in bed because of injuries. (See Table 6.) Survey data indicate males spend somewhat more time (69 days per

TABLE 5.—Number of Restricted Activity Days per 100 Population per Year Due to Injury, by Residence, Age, and Sex: United States, July 1959 - June 1961

Residence and Age	Both Sexes	Male	Female
All Areas			
All Ages	260.9	291.3	232.1
0- 5	61.4	63.3	59.4
6-16	135.3	169.2	100.0
17-24	193.7	273.0	124.7
25-44	270.2	339.3	206.7
45-64	399.7	410.5	389.7
65+	608.1	608.3	608.0
Urban			
All Ages	257.9	277.7	239.8
0- 5	71.7	75.1	68.2
6-16	141.0	182.7	98.4
17-24	174.1	245.2	114.0
25-44	275.3	341.7	215.1
45-64	375.9	359.0	390.7
65+	523.4	476.4	558.5
Rural-Nonfarm			
All Ages	257.7	295.4	220.9
0- 5	50.5	43.5	57.6
6-16	133.8	161.7	104.1
17-24	232.9	358.9	129.6
25-44	258.9	329.1	193.7
45-64	401.2	420.6	381.4
65+	834.2	876.6	796.7
Rural-Farm			
All Ages	283.3	344.5	218.0
0- 5	40.8	60.0	(*)
6-16	116.8	135.4	96.9
17-24	217.7	251.6	179.3
25-44	273.2	355.8	193.9
45-64	519.0	626.9	399.7
65+	650.6	744.2	543.6

*Magnitude of sampling error precludes showing separate estimates.

Source: *Health Statistics From the U. S. National Health Survey*, Series B, No. 40, Table 1, February 1963.

TABLE 6.—Number of Bed Disability Days per 100 Population per Year Due to Injury, by Residence, Age, and Sex: United States, July 1959 - June 1961

Residence and Age	Both Sexes	Male	Female
All Areas			
All Ages	64.4	68.6	60.4
0- 5	27.2	25.9	25.5
6-16	31.1	36.1	25.8
17-24	34.2	45.1	24.6
25-44	68.4	84.7	53.4
45-64	98.9	101.4	96.5
65+	147.1	130.0	161.1
Urban			
All Ages	62.8	68.8	58.3
0- 5	29.1	29.7	28.5
6-16	31.9	40.0	23.6
17-24	31.7	44.9	20.5
25-44	71.5	88.2	56.3
45-64	93.2	97.6	89.3
65+	113.5	88.0	132.5
Rural-Nonfarm			
All Ages	66.7	65.7	67.7
0- 5	30.0	22.2	38.0
6-16	28.8	29.7	27.9
17-24	40.4	45.4	36.3
25-44	62.4	72.4	53.1
45-64	109.7	113.8	105.6
65+	227.0	179.5	269.0
Rural-Farm			
All Ages	66.8	78.6	54.2
0- 5	(*)	(*)	(*)
6-16	32.9	35.7	30.0
17-24	34.5	45.5	(*)
25-44	68.1	100.8	36.7
45-64	108.3	96.6	121.2
65+	181.7	230.7	125.6

*Magnitude of sampling error precludes showing separate estimates.

Source: *Health Statistics From the U. S. National Health Survey,* Series B, No. 40, Table 2, February 1963.

100 persons) in bed because of injuries than females (60 days per 100 population). The number of bed disability days due to injury increases as age increases, reaching 147 days per 100 persons in the 65-years-and-over age class. However, older women (65 years and over) are bedridden because of injury more than men in this age group.

Work-loss days because of injury represent a more readily calculable economic cost to the nation. According to the data collected, among every 100 persons 17 years of age and over currently employed, 126 days of work are lost annually because of injury. Males lose an average of 145 work days due to injury per 100 employed, while females lose 87

NUMBER OF BED DISABILITY DAYS PER 100 POPULATION PER YEAR DUE TO INJURY

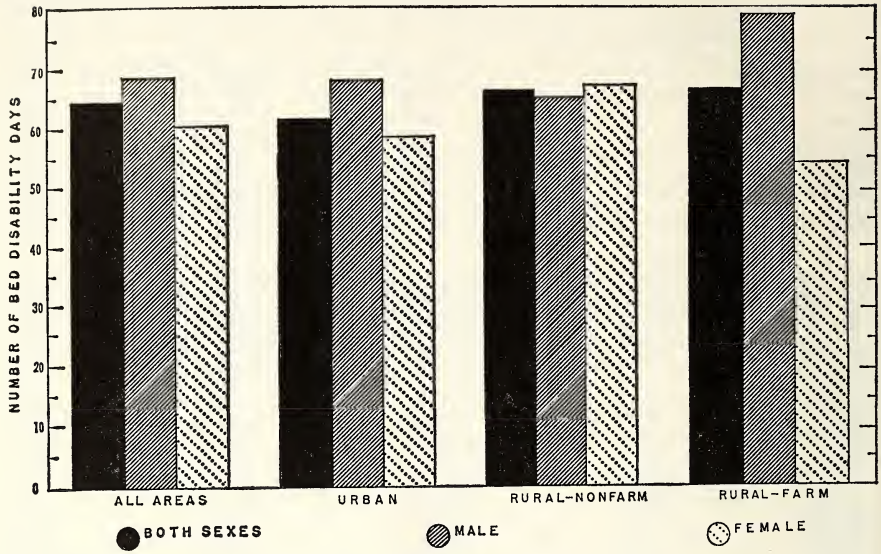

FIGURE 3

NUMBER OF WORK DAYS LOST PER YEAR PER 100 EMPLOYED MALES BY AGE GROUP

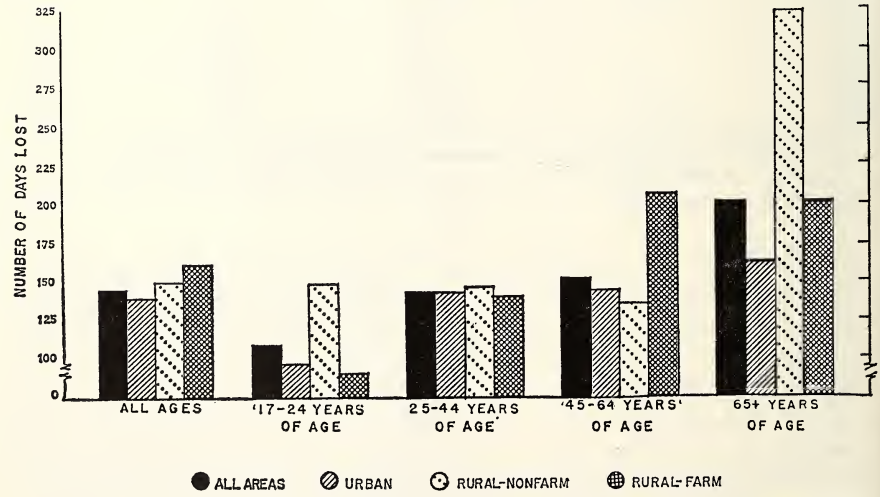

FIGURE 4

days per 100 employed. The older women (65 year and over), in contrast to women in all younger age groups, lose more days due to injury than men in their corresponding age bracket.

Residence Differences.—The rural-farm population experienced a considerably higher rate of restricted activity days than the urban or rural-nonfarm population. As shown in Table 5, persons living on farms annually experience 283 days of disability for every 100 population, while city dwellers and rural-nonfarm residents of all ages have 258 days of disability annually per 100 persons. Interestingly, study of age distribution indicates that urban persons under 16 years of age have a higher rate of activity-restricting days than both rural-farm and rural-nonfarm persons in these ages. The pattern reverses amongst older age groups, with rural-nonfarm persons 65 years and over having

TABLE 7.—Average Annual Number of Work-Loss Days and Number of Work-Loss Days per 100 Currently Employed Persons per Year Due to Injury, by Residence, Age, and Sex: United States, July 1959 - June 1961

Residence and Age	Average Number of Work-Loss Days in Thousands			Number of Work-Loss Days per 100 Currently Employed Persons per Year		
	Both Sexes	Male	Female	Both Sexes	Male	Female
All Areas						
All Ages	83,773	64,112	19,661	125.5	144.8	87.4
17-24	7,084	6,277	807	72.1	108.8	19.9
25-44	36,239	29,603	6,636	120.9	143.7	70.8
45-64	33,500	23,744	9,756	141.0	151.5	120.7
65+	6,950	4,487	2,463	215.9	201.1	249.3
Urban						
All Ages	52,525	37,480	15,045	123.6	139.2	96.6
17-24	4,135	3,501	634	64.7	98.3	22.4
45-64	21,865	14,335	7,529	140.0	146.2	129.5
65+	4,412	2,205	2,207	208.6	162.6	290.8
Rural-Nonfarm						
All Ages	20,944	17,676	3,268	123.3	150.1	62.7
17-24	2,148	2,014	(*)	95.3	147.8	(*)
25-44	10,888	9,188	1,700	123.9	146.4	67.8
45-64	6,264	5,086	1,178	116.9	137.0	71.6
65+	1,644	1,388	(*)	277.7	324.3	(*)
Rural-Farm						
All Ages	10,304	8,956	1,348	141.6	161.0	78.6
17-24	801	762	(*)	67.7	90.1	(*)
25-44	3,238	2,977	(*)	115.2	140.6	(*)
45-64	5,371	4,322	1,048	193.6	299.7	168.5
65+	895	895	(*)	175.1	199.8	(*)

*Magnitude of sampling error precludes showing separate estimates.

Source: *Health Statistics From the U. S. National Health Survey,* Series B, No. 40, Table 3, February 1963.

the highest rate of restricted activity days of the three residence groups.

One interesting observation can be made from the data relating to bed disability days. That is, the number of disability days per 100 males shows an inverse correlation to population density insofar as the latter is expressed in residence terms. In other words, the highest rate of bed disability is in rural-farm areas. This pattern is not so clear-cut for the farm population as a whole because females on farms have fewer days of bed disability per 100 population than females in rural-nonfarm areas or in cities.

Employed farm persons 17 years of age and over lose more work days each year per 100 persons than do employed urban or rural-nonfarm persons of this age. However, this is true only because of the high number of work days per male employed on farms. Females employed on farms lose fewer days than employed urban females, relatively speaking. However, employed rural-nonfarm females have the lowest work-loss rate of all. (See Table 7.)

The above findings are of importance to persons interested in improving the efficiency of agriculture. *They definitely establish the fact that accidental injuries while at work represent a higher cost to farmers than to urban or rural-nonfarm workers.*

Accidental Deaths in Louisiana—1962

It has already been pointed out that statistics on nonfatal accidents are not collected at the state level in Louisiana. However, fatal accidents are officially recorded, and these data provide some indication of the importance of accidents in the state. Through the cooperation of the Louisiana State Department of Health, it was possible to include the latest available data on accidental deaths in the state in this report. The writer wishes to acknowledge, in addition, special tabulations made by State Department of Health personnel which show accidental deaths according to residence.

Altogether, 1,997 accidental deaths occurred in Louisiana during 1962. Only 12 of the individuals who died accidentally in the state maintained a permanent residence outside of the state. Table 8 has been prepared to show the accidental deaths in the state by parish, by race, and by residence. It will be noted that some 892 deaths occurred to people in places classified as rural. This is 44.7 per cent of the total number of accidental deaths.

No attempt is made here to analyze accidental deaths according to geographic distribution. It can readily be seen, however, that south Louisiana parishes have more accidental deaths classified as rural than do north Louisiana parishes. A special study is needed to determine whether this is a function of population density or of other factors. The writer is of the opinion that type-farming and other cultural differences help account for this differential.

TABLE 8.—1962 Accidental Deaths in Louisiana, by Parish, Residence, and Race

Parish	Total	Residence		Race	
		Urban	Rural	White	Nonwhite
Acadia	27	13	14	22	5
Allen	14	7	7	10	4
Ascension	16	4	12	9	7
Assumption	10	—	10	4	6
Avoyelles	32	7	25	18	14
Beauregard	8	4	4	7	1
Bienville	10	1	9	7	3
Bossier	21	6	15	11	10
Caddo	106	85	21	66	40
Calcasieu	58	39	19	51	7
Caldwell	5	—	5	3	2
Cameron	4	—	4	2	2
Catahoula	6	—	6	5	1
Claiborne	8	4	4	3	5
Concordia	7	4	3	1	6
DeSoto	19	4	15	5	14
E. Baton Rouge	93	62	31	66	27
E. Carroll	13	4	9	4	9
E. Feliciana	9	—	9	6	3
Evangeline	25	6	19	15	10
Franklin	18	3	15	11	7
Grant	6	—	6	5	1
Iberia	33	17	16	24	9
Iberville	15	3	12	7	8
Jackson	8	4	4	5	3
Jefferson	106	35	71	84	22
Jefferson Davis	14	8	6	10	4
Lafayette	49	35	14	39	10
Lafourche	39	11	28	32	7
LaSalle	4	—	4	3	1
Lincoln	9	4	5	5	4
Livingston	22	6	16	18	4
Madison	16	7	9	7	9
Morehouse	23	6	17	5	18
Natchitoches	21	5	16	8	13
Orleans	335	335	—	213	122
Ouachita	50	34	16	36	14
Plaquemines	21	—	21	13	8
Pointe Coupee	10	2	8	3	7
Rapides	60	31	29	37	23
Red River	9	—	9	5	4
Richland	15	4	11	8	7
Sabine	16	3	13	11	5
St. Bernard	26	—	26	21	5
St. Charles	18	—	18	9	9
St. Helena	11	—	11	4	7
St. James	5	—	5	1	4
St. John	9	—	9	4	5
St. Landry	55	19	36	26	29
St. Martin	13	4	9	11	2
St. Mary	27	13	14	19	8

(Continued)

TABLE 8 (Continued)

Parish	Total	Residence		Race	
		Urban	Rural	White	Nonwhite
St. Tammany	22	9	13	17	5
Tangipahoa	56	20	36	33	23
Tensas	11	—	11	—	11
Terrebonne	42	16	26	32	10
Union	16	5	11	9	7
Vermilion	10	5	5	10	—
Vernon	15	3	12	13	2
Washington	29	16	13	16	13
Webster	18	7	11	13	5
W. Baton Rouge	17	3	14	7	10
W. Carroll	11	—	11	6	5
W. Feliciana	5	—	5	2	3
Winn	9	—	9	8	1
Out of State	182	182	—	147	35
Totals	1,997	1,105	892	1,312	685

The Farm Accident Complex

The foregoing data from the National Health Survey made it clear that high rates of accidents are associated with agriculture as an occupation and not as a place of residence. In this regard, a clear distinction should be maintained between accidents occurring in rural-farm areas and those occurring as a result of farm work. Farms, when viewed as a place of residence, have relatively low accident rates. *However, farm work is more closely associated with accidents than nonfarm work,* and this is the concern of the remainder of the present report.

Since the National Health Survey was not designed to show the relationship of accidents to a complex of socio-economic factors, a survey of this nature was planned, as brought out previously, for a sample population in the state. The field study planned in Louisiana was designed to shed light on farming practices and attitudes of farmers which might account for their accident proneness. This approach was in keeping with the hypothesis that farming as an occupation is more conducive to accidents because of certain socio-cultural factors. The safety precautions taken on farms were considered especially pertinent to accidents.

Factors Related to Farm Accidents in Louisiana

At this point, the reader may be reminded that the data presented are for the sample areas described in the introduction to this report. It was determined that some 32 major accidents (including 8 deaths) occurred on the 297 sample farms during the year preceding the study and some 23 minor accidents occurred on these farms in the month

previous to the study.[8] Major accidents were defined as *those which required professional medical attention or caused a restriction of normal activities for at least a day or caused a loss of 25 dollars or more in property damage.* Minor accidents were defined as *those serious enough to require some kind of attention before carrying on normal activities but not serious enough to restrict activity for a day.*

Accidents on farms were related to several independent variables. (See Table 9.) Percentage distributions were not calculated because the numbers were too small. For this reason, the data must be interpreted with caution and considered as case studies. Nevertheless, the patterns emerging are consistent and provide a basis for further study.[9]

The largest number of major accidents occurred on the largest farms. This is what would be expected, of course, in terms of the time, machinery, etc. involved. However, minor accidents were reported more often on the smaller farms. This appears as an inconsistency, and may be due to the difficulty of one respondent knowing about all minor accidents on a large farm. The same pattern of accidents occurs when total man-days worked are used as the independent variable. Farms with a thousand or more man-days worked annually, had by far the highest number of major accidents, while the farms with the lowest number of man-days worked had the highest number of minor injuries. The larger farms, in terms of value of farm machinery, had the higher rates of major accidents, but the smaller farms had the higher rates of minor accidents. This finding parallels the findings relating to size of operation. The pattern emerging from the study was for the farms with the highest levels of living to have the highest number of major accidents.

When education of the operator is related to accidents, it is clear that the better educated farmers had the least number of both major and minor accidents. Although this finding needs further testing, it provides insight as to the reasons for accidents.

The data indicate that middle-aged farmers are the ones who have the largest number of accidents, both major and minor. This is probably true because of their larger numbers. The data did not lend themselves to a rate study by age.

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[8]The findings paralleled those of similar studies in other states with few exceptions. See: *Selected Environmental Factors Associated With Farm and Farm Home Accidents in Missouri, op. cit.,* and "Selected Environmental and Human Factors Associated with The Incidence of Accidents of Farm People in Pennsylvania," *op. cit.*

[9]It is interesting to expand the findings of the study to include all farms in the state. Despite the obvious *roughness* of these data, it can be estimated that from 300 to 400 persons die in Louisiana each year as a result of farm accidents, that around 6,000 major farm acidents occur annually, and that 5,000 minor farm accidents occur each month. It should be noted that the estimates of deaths here are considerably larger than the records of the state Health Department show, but the writer feels reporting problems plus lower accident rates on non-commercial farms (residential and subsistence farms) account for this discrepancy.

TABLE 9.—Selected Socio-Economic Factors Related to Major and Minor Accidents Occurring on Farms in Sample Populations

Socio-Cultural Factors	Number of Major Accidents in Past Year	Number of Minor Accidents in Past Year
Total Farm Acreage per Farm		
1-249 Acres	10	14
250-449 Acres	4	3
450 and Over	18	6
Total Man-Days Worked per Farm		
0-499	4	11
500-999	8	8
1000 and Over	20	4
Levels of Living		
Low	1	0
Middle	11	16
High	20	7
Education of Operator		
1- 8 Years	21	16
9-12 Years	4	3
13 Years and Over	7	4
Age of Operator		
Under 39 Years	6	5
40 to 49 Years	16	10
50 Years and Over	10	8
Ownership Class		
Owner	20	13
Renter	12	10
Value of Farm Machinery per Farm		
Under $10,000	7	12
$10,000 and Over	25	11
Number of People Working per Farm		
Under 10	8	15
10-20	8	4
21 and Over	16	4
Operator's or Spouse's Attendance at Safety Meetings		
Yes	9	3
No	23	20

Owners were found to be more accident prone than renters for both major and minor accidents. This pattern can be explained, perhaps, in terms of their involvement in more risk situations in keeping with their ownership responsibilities.

Finally, it is interesting to note that those operators who attended

safety meetings had the lowest accident rates in both the major and minor categories. Whether or not these meetings helped create a greater sense of safety is subject to conjecture. Neverthless, one is safe in hypothesizing that persons who attend safety meetings are more safety conscious.

Safety Precautions Normally Taken by Farmers

A list of safety precautions, including most safety measures which normally would be taken in connection with farming operations, was included in the questionnaire. The tabulated responses of interviewees are shown in Table 10. A study of the pattern of responses indicates safety practices can be grouped into three classes, including: Class I, those practices and precautions followed by at least 90 per cent of the farmers; Class II, those practices normally followed by at least half but not over 90 per cent of the interviewees; and Class III, those practices observed as a matter of course by less than half of the interviewees. The latter are of greatest significance to this study.

Class III safety precautions, those followed least often, included prohibiting smoking in barn, discussing fire plans with family members, having on hand antidotes for toxic chemicals, and ownership and accessibility of fire extinguishers. Admittedly, these are the types of precautions which are not usually followed in a family situation. Nevertheless, they oftentimes mean the difference between a serious accident and one not so serious. A quote from the written report of a field interviewer who questioned approximately half of the farmers is appropos here:

TABLE 10.—Safety Precautions Taken by Interviewees and Their Families

Safety Precautions	Percentage of Farms on Which	
	Precaution Normally Taken	Precaution Not Normally Taken
Prohibiting smoking in barn	34.0	66.0
Fire extinguishers	26.0	74.0
Approved electric wiring	90.0	10.0
Gasoline safely stored	95.0	5.0
Fire plan discussed	6.0	94.0
Printed instructions studied	96.0	4.0
Experienced machine operators	77.0	23.0
Safety guards installed	81.0	20.0
Instructions given on new machinery	98.0	2.0
Dangerous animals kept enclosed	97.0	3.0
Children warned of danger	100.0	0
Recommendations of manufacturers followed	97.0	3.0
Workers required to observe safety precautions	66.0	34.0
Antidotes for toxic chemicals on hand	17.0	84.0
Chemicals stored safely	96.0	4.0
Home checked periodically for fire hazards	96.0	4.0
Family members aware of safety precautions	95.0	5.0
Family sanitation conscious	96.0	4.0
First aid kit readily available	91.0	9.0

Most respondents who reported that they allowed smoking in the barn claimed either that they had to because they could not keep their labor from smoking there or that there was no hay or anything in the barn to burn. Also, many of those who reported not allowing smoking in the barn were one-man farms where the farmer just did not happen to be a smoker. Others claimed that they did not allow smoking in the barn, but they knew that their hired help did smoke there, nevertheless.[10]

None of the respondents had fire extinguishers in their homes. Most of the farms that had fire extinguishers were the very large farms. They usually had them in the barn, shed, or shop. Very few had fire extinguishers on their equipment.

Safety precautions which were followed by over half but less than 90 per cent of the farmers interviewed (Class II) included: the use of experienced operators on farm machines, the installation of safety guards on equipment, and the requiring of workers to observe safety precautions.

Respondents' Opinions As to Why Farmers Have High Accident Rates

Each farmer interviewed was asked for his opinion as to why farmers had high rates of accidents. The majority of respondents, 56.5 per cent, said that carelessness was the most important factor in accidents. (See Table 11.) Approximately 12 per cent of the respondents said that "poor labor" was the main cause of accidents. Probing techniques determined that this expression carried the implication that illiterate, unskilled laborers tended to be ignorant of safety precautions. This finding suggests that some farmers do not set high qualification levels for their employees. Nearly one in eight interviewees said that machine complexity was the important reason for higher accident rates on farms, and one-seventh attributed accidents to *fate* or a miscellaneous variety of allied reasons. The implication in each instance was that such things were in the hands of other than mortal beings.

TABLE 11.—Respondents' Opinions as to the Reasons Farmers Have a High Accident Rate

Reason	Number	Per Cent
Carelessness	166	56.4
Job and machine complexity	37	12.6
Hurrying	14	4.8
"Poor labor"	35	11.9
"Fate and other"	42	14.3
Total	294	100.0

[10]Written report prepared by John Drysdale, Graduate Assistant, Department of Rural Sociology.

Analysis of Findings

The Accident Syndrome

The many studies made of accidents suggest that a given accident is the culmination of an inevitable combination of factors found in the cultural background of the particular individual or group involved. In other words, while accidents may be capricious in and of themselves, the circumstances within which they occur are structured to a large extent. The combination of factors which together determine or influence accidents has been termed the *accident syndrome.*[11]

It has been determined that three sets of factors underlie most accidents: (1) environmental hazards; (2) temporary or prolonged personal impairment or maladjustment, and (3) faulty behavior under stress. The first set of factors is of primary importance to the sociologists, while the latter two sets are more the concern of psychologists. Assuming that personal impairment or maladjustment and faulty behavior under stress are personality variables not necessarily related to residence or occupation, then occupational differences in accident rates become a function of environment or "situation." This is the theoretical approach taken in the analysis of the findings presented in the preceding discussions.

Situational Factors in Farm Accidents

The significant findings with regards to the objectives of the present study of farm accidents may be summarized as follows: (1) Accident rates are higher for persons employed on farm jobs, when non-farm jobs are taken as a whole for comparison purposes. (2) The social cost of accidents measured in terms of days lost and disability days bears disproportionately on those persons engaged in agriculture as an occupation. (3) Certain precautions are not followed consistently by farmers. (4) Farmers view accidents resignedly, attributing their cause to carelessness, illiterate and unskilled labor, and fate.

The above findings point clearly to situational factors which structure farming as an occupation in such a way as to encourage accidents. Analysis of these findings suggests that three sets of situational (or environmental) factors are involved as follows: (1) social control factors; (2) labor factors; (3) socio-psychological factors. Each of these is closely related, of course. They may be elaborated as follows.

Social Control Factors.—The fact that more accidents occur on farms suggests differentials relating to procedure and practices. One of the first observations which can be made is that, compared with most industrial occupations, farm social systems do not have as many formal control mechanisms to make persons and groups systematically abide by safety precautions. This pattern of behavior can be validated by

[11]Morris S. Schulzinger, "The Accident Syndrome," unpublished paper.

comparisons with non-farm industrial operations at almost any level. The latter, for the most part, have readily detectable mechanisms for controlling safety which have been imposed by insurance companies, by labor unions, and by management itself for economic as well as safety reasons. Periodic inspections and rigid supervision are provided as a matter of course, sometimes with the additional sanction of state, local, or federal government statutes. Not only are these mechanisms generally absent on farms, but national value orientations related to farming which favor individualism, free enterprise, and the like, provide strong negative sanction in this respect. According to the National Health Survey, more rural-farm persons, relatively speaking, are injured through being struck by a moving object, or caught in, pinched, or crushed between two objects, than are urban and rural-nonfarm persons. Injuries of these types are due to work hazards and could be prevented, ostensibly, with proper safety precautions. There is simply no mechanism built into farm social systems which assures that even minimum safety practices will be followed. Safety is more a matter of the individual operation than anything else.

Labor Force Factors.—The second class of situational factors stems from the fact that farming tends to attract and tolerate what might be termed "substandard" or "marginal" labor to a disproportionate extent. Here the evidence is inductive and somewhat subjective in nature. The present study provided a clue in terms of farmers' verbalized reasons for accidents, and a review of prevailing work rates by occupation and industry substantiated that farm workers are paid less on the average.[12] The phenomenon of "poor" labor is not unrelated to the fact that there are fewer formal social control mechanisms in farming, but occurs at a different level of control than that of safety practices *per se*. That is, farm workers are not screened as carefully for mental, educational, and physical deficiencies as are industrial workers. One interviewer reports:

> Many of the respondents complained about the lack of availability of good labor. Many of the medium and large scale farm operators reported that even though their labor force (mostly Negroes) was experienced, they were not very competent. That is, most of these Negroes were born and raised on farms and usually had early experience with farm equipment, but their "attitude" was what the operators criticized, for the most part. Their attitude was generally described as one of carelessness, shiftlessness, irresponsibility, etc.
>
> On the small, one or two man farms, the answer was almost without exception that only experienced and competent men were allowed to operate the farm machinery. And I believe that this was true. A small farm operator usually cannot afford to risk his tractor operation to a hired hand (considering the type of labor available to him) even if he could afford to pay it.
>
> My impression was that worker instruction was minimal and restricted to bare essentials of operation. Many, however, did instruct their workers on care of machinery also. Some farmers had a somewhat fatalistic attitude about this—

[12]For data on wages earned by farm workers, see: *Advance Report on the Hired Farm Working Force of 1962,* Farm Population Branch, E. R. S., U. S. D. A., October 1963. Rates in the South are especially low.

"What good does it do me to preach to them about taking care of the equipment? They don't listen."[13]

One can hypothesize that comparative wage rates are such as not to attract the higher skilled, better educated worker, but this does not explain why farm wage rates are low. The important "situational" facts for this study are: (1) Substandard laborers lack the capacity to detect potentially hazardous situations and thus are more likely to become injured. (2) Farming as an occupation is more hazardous because of the necessity to deal with machinery, etc. under less "controlled" conditions. (3) Farmers employ "substandard" labor to a disproportionate extent. A fourth factor might be added to the effect that "substandard" labor does not insist upon safety devices and often misuses those devices provided.

Socio-Psychological Factors.—The third class of situational factors is quite different from the first two. It is manifest in the attitude of farmers toward risk-taking. The interviews conducted indicated that farmers as a group looked upon risk as a part of farm life and that it was a "poor" farmer who took the time to fully practice safety. Beyond this, there was a definite impression given that when risks, even dangerous ones, were taken in the interest of expediting work, the act was both "honorable" and status oriented. To be hurt or injured in such an undertaking provided one with an image of the "go-getter," the "doer," and other favorable stereotypes rather than of the careless and thoughtless person. In this regard, a clear distinction is made between accidents traceable to acts of bravado and those which emanated from ignorance or stupidity. In the former instance, the act was deliberate and done in full knowledge of possible consequences. The account of one of the interviewers is cogent:

> The third type of fatal tractor accident is mostly due to what could best be called "foolishness" or "madness" rather than just carelessness. Many farmers have tractors with hand clutches. These farmers (some of them) persistently misuse their tractors. Accidents typically happen in this manner — the driver backs up his tractor to a disc, puts it into neutral, and climbs down to hook on the disc. If he finds that he needs to pull up a couple of inches, he tries to operate the tractor while standing on the ground. He hand clutches the tractor with one hand and reaches down with the other hand to hook the disc to the drawbar. Because of the long reach his hand slips off the clutch and the tractor lunges forward in low gear. All the time he was working on the hooking up, his feet were no more than six or eight inches from the disc. Now the sudden forward motion of the tractor surprises him and it is almost impossible for him to get out of the way in that split second. And once his foot gets caught — well, he's bound to be run over completely by the disc. Now this sounds practically unbelievable, but a significant percentage of the deaths have happened in just this manner. And of those who have tractors with hand clutches, the practice of "hooking up" just described is unbelievably common.[14]

[13]Written report by John Drysdale, Graduate Assistant, Department of Rural Sociology.

[14]*Ibid.*

Similar patterns of behavior have been observed in other occupational situations and accounted for in terms of compulsive drives, triggered by subconscious desires to show one's virility, etc. However, for attitudes and practices which become widespread in one occupational group, there must be a cultural sanction. Simply put, this means that farmers internalize such behavior patterns because they are promoted overtly or covertly in the subculture within which they participate.

Implications

The major implication of the above analysis is that the high accident rate on farms can be accounted for in terms of the social and cultural environment within which farm work is done. The environment is such as to: (1) discourage formal mechanisms for enforcing precautions; (2) encourage the employment of persons who are not capable of assessing the potential danger of given work situations; and (3) encourage the individual farmer to take foolish risks. These factors appear to have become so much a part of the agricultural subculture of the nation that it will require an intensive educational effort over a period of time to change this situation.